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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,130	08/04/2003	Brian G. Johnson	ITO.0045US (P16093)	5774

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EXAMINER	
LE, THAO P	
ART UNIT	PAPER NUMBER
2818	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/634,130	JOHNSON ET AL.	
	Examiner	Art Unit	
	Thao P. Le	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Amendment

This office action is responsive to communication(s) filed on 12/11/2006.

Claims 1-30 are presented for examination.

Claims 1, 14 have been currently amended.

Remarks from applicant have been fully considered but moot in view of new ground of rejection.

Claim Rejections

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7, 10, 12-22, 24-30 are rejected under 35 USC 103 (a) as being unpatentable over Parkinson et al., U.S. Pub No. 2004/0114413, hereinafter Parkinson, in view of Khouri et al., U.S. Publication No. 2003/0223285.

Regarding claims 1, 14, 27, Parkinson discloses a product and method of making the product comprising: a non-switching ovonic material 120 [0035]; a phase changeable material 130 that changes between more conductive and less conductive states (between crystalline, semi-crystalline, amorphous, or semi-amorphous states) coupled to the non-switching ovonic material (Fig. 1, paragraphs 0001, 0025-0035). Parkinson discloses that the ovonic material 120 may remain permanently amorphous and the I-V characteristic may remain the same throughout the operating life [0035]. Since the state of the material 120 doesn't change, the resistance of the layer 120 doesn't change, therefore, the ovonic material 120 is non-switching ovonic material. The ovonic material is made of chalcogenide material.

Parkinson fails to disclose the non-switching ovonic/chalcogenide material is substantially crystalline. Khouri et al. discloses the ovonic material (chalcogenide material, element 3) is in crystalline state. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the non-switching material stays stable in crystalline phase because chalcogenide is normally in the crystalline state in order to enable a good flow of current. The electrical conductivity of crystalline phase chalcogenide alloy is significantly higher than that of amorphous phase due to the differences in physical order of the alloy material at the microstructural

level and the fact that electrons travel more efficiently through crystalline phase than through amorphous phase.

Still regarding claim 27, Parkinson discloses the system comprises a processor, a wireless interface coupled to the processor, and the device above (page 12).

Regarding claims 3, 16, Parkinson discloses the ovonic material contacts with an electrode 151 (Fig. 1).

Regarding claim 18, Parkinson discloses the substrate is under the first ovonic material.

Regarding claims 24-26, 29, Parkinson discloses wherein the non-switching ovonic material and the phase change material are both formed of a chalcogenide.

Regarding claim 28, Parkinson discloses the wireless includes a dipole antenna (para 0134).

Regarding claims 5-7, 10, 19-22, Parkinson fails to disclose the shape of the ovonic material and/or phase change materials are in a pore formed in an insulator or having a cup shape. However, it is well known in the art that the selection of such parameters such as **energy, concentration, temperature, time, molar fraction, depth, thickness, shape, etc.**, would have been obvious and involve routine optimization which has been held to be within the level of ordinary skill in the art. "Normally, it is to be expected that a change in **energy, concentration, temperature, time, molar fraction, depth, thickness, shape, etc.**, or in conbination of the parameters would be an unpatentable modification. Under some circumstances,

however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality.... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller 105 USPQ233, 255 (CCPA 1955). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmscher 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CCPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).*

Regarding claim 13, Parkinson discloses the material of the ovonic layer is a stable structure phase [0035].

Claims 8, 9, 11, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Parkinson et al., U.S. Pub No. 2004/0114413, hereinafter Parkinson, in view of Khouri et al., U.S. Publication No. 2003/0223285, further in view of Ovshinsky et al, U.S. Pub No. 2004/0178401.

Regarding claims 8, 9, 11, and 23, Parkinson fails to disclose a portion of second ovonic material is on a portion of the phase change material and covering the phase change material with an insulating material or nitride. Ovshinsky discloses filling the phase change material into a pore formed in a dielectric material including a portion of second ovonic material is on a portion of the phase change material (Fig. 3, part of

ovonic layer is physical contact with B2 and on GST layer) and the phase change material is covered by insulating layer B2. It would have been obvious to one having ordinary skill in the art to form a portion of second ovonic material on a portion of the phase change material and the phase change material is covered by insulating layer as in Ovshinsky in Parkinson device because portion of ovonic material on a portion of phase change material would provide electrically contacts between the ovonic material, phase change material and conductive material, and the insulating material covering the phase change material for insulation and for protection. It would have been well known in the art that the nitride material is good insulator and widely used as insulating material.

Claims 1, 3, 14, 16, 24-28, 29 are rejected under 35 USC 103 (a) as being unpatentable over Lowrey, U.S. Pub No. 2004/0113137, hereinafter Lowrey, in view of Khouri et al., U.S. Publication No. 2003/0223285.

Regarding claims 1, 14, 27, Lowrey discloses a product and method of making the product comprising: a non-switching ovonic material 120, a phase changeable material 130 that changes between more conductive and less conductive states (between crystalline, semi-crystalline, amorphous, or semi-amorphous states) coupled to the non-switching ovonic material (Fig. 1, paragraphs 0001, 0025-0033). Parkinson discloses that the ovonic material 120 may remain permanently amorphous and the I-V characteristic may remain the same throughout the operating life [0033]. Since the

state of the material 120 doesn't change, the resistance of the layer 120 doesn't change, therefore, the ovonic material 120 is non-switching ovonic material.

Lowrey fails to disclose the non-switching ovonic/chalcogenide material is substantially crystalline. Khouri et al. discloses the ovonic material (chalcogenide material, element 3) is in crystalline state. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the non-switching material stays stable in crystalline phase because chalcogenide is normally in the crystalline state in order to enable a good flow of current. The electrical conductivity of crystalline phase chalcogenide alloy is significantly higher than that of amorphous phase due to the differences in physical order of the alloy material at the microstructural level and the fact that electrons travel more efficiently through crystalline phase than through amorphous phase.

Still regarding claim 27, Lowrey discloses the system comprises a processor, a wireless interface coupled to the processor, and the device above (page 13).

Regarding claims 3, 16, Lowrey discloses the ovonic material contacts electrode 151 (Fig. 1).

Regarding claims 24-26, 29, Lowrey discloses wherein the non-switching ovonic material and the phase change material are both formed of a chalcogenide.

Regarding claim 28, Lowrey discloses the wireless includes a dipole antenna (para 0133).

Claims 1-4, 14-18, 24-27, 29-30 are rejected under 35 USC 103 (a) as being unpatentable over Gilton, U.S. Patent No. 6,809,326, in view of Khouri et al., U.S. Publication No. 2003/0223285.

Regarding claims 1, 14, 27, Gilton discloses a product and method of making the product comprising: a non-switching ovonic material 424 (metal doped chalcogenide material, stable state), a phase changeable material 208 that changes between more conductive and less conductive states (between crystalline, semi-crystalline, amorphous, or semi-amorphous states) coupled to the non-switching ovonic material (Figs. 1, 3; paragraphs 0001,0025-0033).

Still regarding claim 27, Gilton discloses the structure above is used in memory cells, it is inherent that the memory cells can be installed in wireless devices which is inherently coupled to a processor based device.

Gilton fails to disclose the non-switching ovonic/chalcogenide material is substantially crystalline. Khouri et al. discloses the ovonic material (chalcogenide material, element 3) is in crystalline state. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the non-switching material stays stable in crystalline phase because chalcogenide is normally in the crystalline state in order to enable a good flow of current. The electrical conductivity of crystalline phase chalcogenide alloy is significantly higher than that of amorphous phase due to the differences in physical order of the alloy material at the microstructural

level and the fact that electrons travel more efficiently through crystalline phase than through amorphous phase.

Regarding claims 2, 4, 15, 17, 18, 30, Gilton discloses forming the ovonic layer 424 over the phase change material 208 and forming a second ovonic layer 204 under the phase change material, and contacting the first and second ovonic materials with electrodes 420, 202 (Fig. 3) and a substrate is inherently formed under these layers in memory cells.

Regarding claims 3, 16, Gilton discloses the ovonic material contact electrode 420 (Fig. 3).

Regarding claims 24, 25, 26, 29, Gilton discloses wherein the non-switching ovonic material and the phase change material are both formed of a chalcogenide (lines 30-35, Col. 3; lines 38-40, col. 5).

Conclusion

For the above reasons, it is believed that the rejections should be sustained. Feature of an invention not found in the claims can be given no patentable weight in distinguishing the claimed invention over the prior art.

THIS ACTION IS MADE FINAL. See MPEP ' 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to whose telephone number is (571) 272-1785. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on 571-272-1787. Other inquiries of this application should be called to (571) 272-1562 or the fax number (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thao P. Le
Examiner
March 2, 2007.